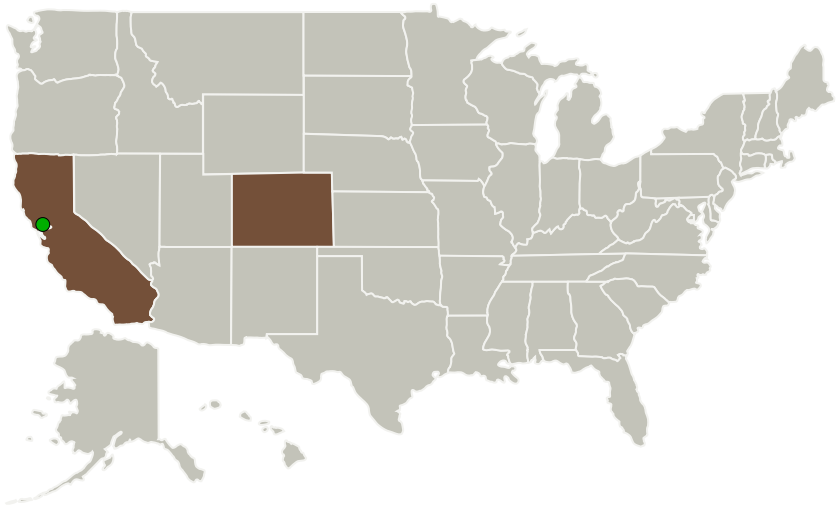
Cubesat SEP Power Module, Phase I

Completed Technology Project (2015 - 2015)

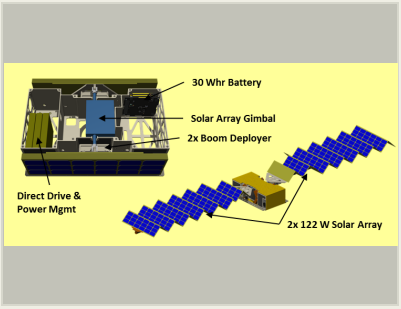
Project Introduction

Today's CubeSats are inherently power limited due to their small size and available surface area. Today's CubeSats offer <100W of available power. This limits their ability to provide high data rate telecommunications, use high power sensors such as lidars, or to travel to distances beyond 1 AU. ExoTerra's SEP Power Module packages over 200 W of power within 1.6U of volume. This increased performance further expands the capabilities of CubeSats and allows them to venture outside Earth orbit. The power module uses a Z-folded, boom deployed array to tightly stow the solar panels during launch. After deployment, it incorporates a single axis gimbal that allows the array to track the sun, providing increased orbit average power versus fixed arrays. Finally, we improve the power efficiency by integrating a 270V direct drive unit. This couples to an Electric Propulsion system to provide a high efficiency propulsion system that's compatible with rideshare launch restrictions.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
ExoTerra Resource, LLC	Lead Organization	Industry	Littleton, Colorado
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California



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Primary U.S. Work Locations	
California	Colorado

Project Transitions

June 2015: Project Start

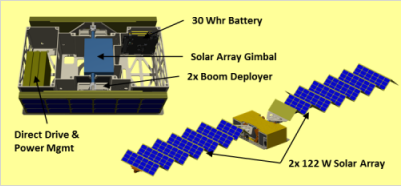
December 2015: Closed out

Closeout Summary: Cubesat SEP Power Module, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/138785)*

Images



Briefing Chart Image
Cubesat SEP Power Module, Phase I
(https://techport.nasa.gov/image/136574)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
ExoTerra Resource, LLC

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Michael Vanwoerkom

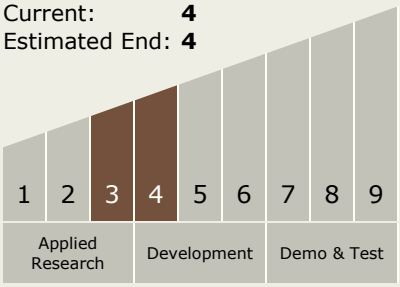
Co-Investigator:
Michael Vanwoerkom

Cubesat SEP Power Module, Phase I

Completed Technology Project (2015 - 2015)

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.1 Photovoltaic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System